第九周上机实验

实验1:

源代码：

// main.cpp

// 实验1

// Created by mac on 16/4/29.

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#include <iostream>

using namespace std;

template <typename T>

void Swap(T &A,T &B){

T temp;

temp=A;

A=B;

B=temp;

}

int main(int argc, const char \* argv[]) {

// insert code here...

int a;int b;

cin>>a>>b;

Swap(a,b);

cout<<a<<' '<<b<<endl;

char m,n;

cin>>m>>n;

Swap(m,n);

cout<<m<<' '<<n<<endl;

return 0;

}

运行结果：

**3 4**

**4 3**

**A B**

**B A**

**Program ended with exit code: 0**

实验2:

源代码：

// main.cpp

// 选择排序的函数模板

// Created by mac on 16/4/27.

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#include <iostream>

using namespace std;

template <typename T>

void ChoiceSort(T \*data,int size){

int i,j,k=0;

T temp;

for(i=0;i<size-1;i++){

k=i;

for(j=i+1;j<size;j++){

if(data[j]<data[k]){

k=j;

}

}

if(k!=i){

temp=data[i];

data[i]=data[k];

data[k]=temp;

}

}

}

int main(int argc, const char \* argv[]) {

// insert code here...

int m,n;

cin>>m;

int \*data;

data=new int[m];

for (int i=0; i<m; i++) {

cin>>data[i];

}

ChoiceSort(data, m);

for (int i=0; i<m; i++) {

cout<<data[i]<<endl;

}

double \*value;

cin>>n;

value=new double[n];

for (int i=0; i<n; i++) {

cin>>value[i];

}

ChoiceSort(value, 5);

for (int i=0; i<n; i++) {

cout<<value[i]<<endl;

}

delete []data;

delete []value;

return 0;

}

运行结果：

**6**

**3 1 4 2 6 5**

**1**

**2**

**3**

**4**

**5**

**6**

**6**

**1.2 3.2 1.1 4.3 5.6 4.6**

**1.1**

**1.2**

**3.2**

**4.3**

**5.6**

**4.6**

**Program ended with exit code: 0**

实验3:

源代码：

// main.cpp

// 3

// Created by mac on 16/4/29.

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#include <iostream>

using namespace std;

template <class T>

T Min(T A,T B){

return A>B?B:A;

}

int main(int argc, const char \* argv[]) {

// insert code here...

double dobj1=1.1,dobj2=2.2;

char cobj1='c',cobj2='w';

int i=12,j=68;

cout<<Min<int>(i,cobj1)<<endl;

cout<<Min(dobj1,dobj2)<<endl;

cout<<Min<char>(cobj2,j)<<endl;

//将显式实例化，改为隐式实例化后。结果出错。

//cout<<Min(i,cobj1)<<endl;

//error:issues description:Users/mac/Desktop/c++ folder/第九周/3/3/main.cpp:24:11: No matching function for call to 'Min'

//cout<<Min(cobj2,j)<<endl;

//error:issues description:/Users/mac/Desktop/c++ folder/第九周/3/3/main.cpp:26:11: No matching function for call to 'Min'

return 0;

}

程序运行结果：

**12**

**1.1**

**D**

**Program ended with exit code: 0**

实验4:

源代码：

// main.cpp

// 4

// Created by mac on 16/4/29.

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#include <iostream>

using namespace std;

const int SIZE=90;

template <typename type>

class Stack{

type stack[SIZE];

int tos;

public:

Stack();

~Stack(){};

void push(type data);

type pop();

};

template <typename type>

Stack<type>::Stack(){

tos=0;

}

template <class type>

void Stack<type>::push(type data){

if(tos!=SIZE){

stack[tos++]=data;

}else{

cout<<"Stack Full!"<<endl;

}

}

template <class type>

type Stack<type>::pop(){

if(tos==0){

cout<<"Stcak empty!"<<endl;

exit(0);

}

return stack[--tos];

}

int main(int argc, const char \* argv[]) {

// insert code here...

Stack<int> stack1;

stack1.push(5);

cout<<stack1.pop()<<endl;

//stack1.pop();

Stack<double> stack2;

stack2.push(8);

cout<<stack2.pop()<<endl;

stack2.pop();

return 0;

}

运行结果：

**5**

**8**

**Stcak empty!**

**Program ended with exit code: 0**

实验5:

源代码：

// main.cpp

// 5

// Created by mac on 16/4/29.

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//将题目中的安全数组改编成安全数组模板类，并在main函数中进行实例化。然后编译、运行程序。最后提交源代码。

#include <iostream>

#include <cstdlib>

using namespace std;

const int SIZE = 3;

template<typename type>

class atype {

type a[SIZE];

public:

atype( ) {

int i;

for(i=0; i<SIZE; i++) a[i] =(type)i ;

}

type &operator[](int i);

};

template<typename type>

type &atype<type>::operator[](int i)

{

if(i<0 || i> SIZE-1) {

cout << "\nIndex value of ";

cout << i << " is out-of-bounds.\n";

exit(1);

}

return a[i];

}

int main( )

{

atype<int> ob;

cout << ob[2]; // 输出 2

cout << " ";

ob[2] = 25; // 下标运算符[]出现在赋值运算符的左边

cout << ob[2]; // 输出 25

ob[3] = 44; // 产生运行时错误，下标3超出了数组边界

return 0;

}

运行结果：

**2 25**

**Index value of 3 is out-of-bounds.**

**Program ended with exit code: 1**